

## **Podium Presentations**

### **Session IX: Epidemiology, Standards Applications, and Prevention II**

Chairs: David Wilder and Kristine Krajnak

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# **RISK ASSESSMENT OF HAND-ARM VIBRATION BY ESTIMATE, TAKING THE EXAMPLE OF HAND-GUIDED STONE-WORKING MACHINES**

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## **Introduction**

Vibration measurements at the workplace are often complicated and expensive. The assessment of the risk in conformity with EC Directive 2002/44/EC “Vibration” (which lays down the minimum requirements of laws in Europe for occupational safety and health) can therefore be carried out on the basis of an estimate based on information from manufacturers as well as by measurement conforming to ISO 5349.

The characteristic values (emission values) determined by manufacturers in laboratory conditions may deviate from the exposure values measured at source at the workplace. Equally, deviations may arise as a result of the delay in the changeover of test methods from the single axis of measurement to the total vibration value for the three axes of measurement conforming to ISO 20643.

To prevent faulty estimates, the manufacturer’s information has to be corrected by a tool-related factor in accordance with CEN/TR 15350. By taking the example of masonry and stone working machines, the empirically determined tool-related correction factor is checked and confirmed.

## **Methods**

Vibration measurements were carried out in accordance with ISO 5349 in practical application conditions on 10 selected typical eccentric and orbital sanders, concrete and disc grinders as well as on wall chasers and stone saws.

## **Results**

The total vibration value obtained for the investigated tools ranged from  $a_{hv} = 3.6 \text{ m/s}^2$  to  $a_{hv} = 11.6 \text{ m/s}^2$ . When the values from the practical measurements are compared with the manufacturer’s vibration values, the underestimation of the risk occurring in some cases can be largely compensated for by the tool-related factors conforming to CEN/TR 15350 (see Figure 1).

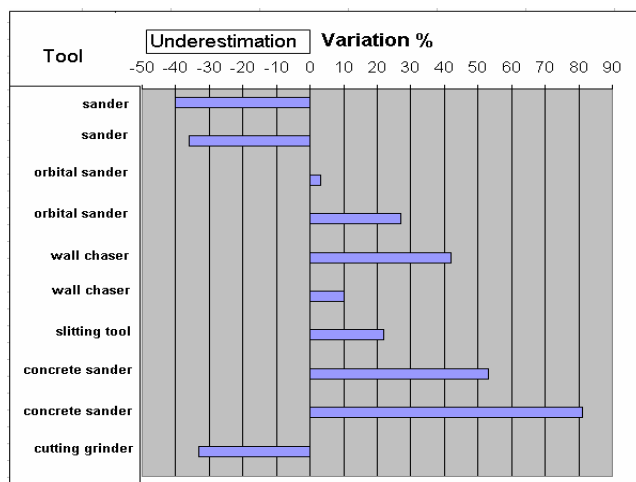


Figure 1.  
Variation of the estimated vibration values from the values obtained in practice after correction.

## Discussion

The risk assessment can be carried out on the basis of an estimate based on information from manufacturers. The procedure is presented with reference to examples. In three of the ten investigated cases, there was slight underestimation after correction. However, these variations lie within the accuracy range achievable with workplace measurements.

## References

1. CEN/TR 15350 - Mechanical vibration – Guideline for the assessment of exposure to hand-transmitted vibration using available information including that provided by manufacturers of machinery (in preparation)
2. ISO20643, Publication date: 2005-02 Mechanical vibration - Hand-held and hand-guided machinery - Principles for evaluation of vibration emission
3. ISO 5349-1, Publication date: 2001-05 Mechanical vibration - Measurement and evaluation of human exposure to hand-transmitted vibration - - Part 1: General requirements- Part 2: Practical guidance for measurement in the workplace
4. DIRECTIVE 2002/44/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (sixteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) Official Journal of the European Communities No. L 177/13 6.7.2002